TAFTCOLLEGE

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Date Reviewed: Fall 2024
Text Update: Fall 2024
C & G E Approved: Fall 2024
Semester effective: Spring 2025

Dental Hygiene (DNTL) 2020 Local Anesthesia and Nitrous Oxide (2.5 Units) CSU
[formerly Dental Hygiene 20]

Prerequisite: Successful completion of all first semester Dental Hygiene Program courses and Chemistry 1520 with a 'C' or higher

Prerequisite knowledge/skills:

Before entering the course the student should be able to:

1. Draw and name structures containing common mono-functional organic molecules and differentiate functional groups when they appear in an organic structure, relate the physical and chemical properties of compounds containing these groups with the structure of each functional classification;
2. Distinguish roles of four major classes of bio-molecules in living cells,
3. Compare and contrast the processes of DNA replication and transcription, RNA translation, and common types of mutations; and
4. Demonstrate knowledge of major biochemical components in metabolism.

Hours and Unit Calculation:
24 hours lecture. (48 Outside of class hours); 48 hours lab (96 Total Student Learning hours) 2.5 Units

Catalog Description: This course emphasizes the pharmacology and physiology of local anesthetic agents and their proper use, the anatomy of the trigeminal nerve, physiology of nerve conduction, how and where local anesthetics work, techniques of maxillary and mandibular anesthesia, management of local and systemic complications and the prevention and management of emergencies. The administration of nitrous oxide as a conscious sedation will be discussed and performed.

Type of Class/Course: Degree Credit

Local Anesthesia for Dental Professionals, Bassett/DiMarco/Naughton, 2nd Ed. Pearson, (2015) 2022 update.
Course Objectives:

By the end of the course, a successful student will be able to:

1. prepare the proper armamentarium for administration of local anesthesia and nitrous oxide-oxygen sedation
2. know the proper infection control procedures
3. understand the fundamentals of nerve impulse generation and transmission as they apply to the action of local anesthetics
4. discuss the pharmacologic properties of local anesthetics, vasoconstrictors, local anesthetic reversal agents, and nitrous oxide-oxygen sedation,
5. understand the pharmacokinetics and the vasoactivity of each of the local anesthetics,

6. know the clinical actions of each local anesthetic agent and their effect on different systems in the body,
7. select the appropriate local anesthetic based on the health of the patient and the procedure,
8. know indications and contraindications to the administration and reversal of local anesthetic agents for all patients,
9. know indications and contraindications to the administration of nitrous oxide –oxygen analgesia agents on all patients,
10. trace or locate the nerves supplying the maxilla and mandible and the areas and structures innervated,
11. calculate the recommended doses for local anesthetic drugs and vasoconstrictors based upon maximum recommended dosage charts, patient age, weight and ASA status,
12. demonstrate physical and psychological evaluations procedures,
13. understand the theory and psychological aspects of pain and anxiety control,
14. select appropriate pain control modalities,
15. discuss recovery from and post-procedure evaluation of local anesthesia and nitrous oxide –oxygen analgesia,
16. demonstrate competency in the basic techniques and steps for effective administration of each of the following injections:
    - 2 Inferior Alveolar (IA) Nerve Blocks
    - Optional: Gow-Gates (GG) Nerve Blocks (Instruction but not scored towards final grade)
    - 2 Lingual Nerve Blocks
    - 2 Mental Nerve Blocks
    - 2 Incisive Nerve Blocks
    - 2 Long Buccal Nerve Blocks
    - 2 Intraseptal (Papillary) Injections (mandibular or maxillary)
    - 2 Anterior Superior Alveolar (ASA) Nerve Blocks/ Infraorbital Nerve Blocks (IO)
    - 2 Middle Superior Alveolar (MSA) Nerve Blocks
    - 2 Posterior Superior Alveolar (PSA) Nerve Blocks
    - 2 Anterior Middle Superior Alveolar (~~ASMA~~ AMSA) Nerve Blocks
    - 2 Greater Palatine (GP) Nerve Block
    - 2 Nasopalatine (NP) Nerve Blocks
    - 2 Supraperiosteal Infiltrations (maxillary or mandibular)
17. discuss the most common local and system complications related to administration of local anesthesia and nitrous oxide-oxygen and management of each
18. explain procedures for the prevention of medical emergencies,
19. identify medical and dental emergencies and proper management of each,
20. demonstrate understanding the proper administration of nitrous oxide,
    a. Administer N_2O-O_2, two formative experiences on a student partner
21. know the indications and the contraindications to the use of nitrous oxide sedation, and
22. identify appropriate patients to administer nitrous oxide sedation
23. complete patient documentation that meet the standard of care, including but not limited to, computation of maximum recommended dosages for local anesthetic and the tile volume, percentage and amount of the gases and duration of administration of nitrous oxide-oxygen analgesia, and
24. understand medical and legal considerations including patient consent, standard of care and patient privacy.

DNTL2020 Local Anesthesia & Nitrous Oxide - Student Learning Outcomes (SLO's)
1. Preparation of the proper armamentarium for administration of local anesthesia.
2. Demonstrate the proper injection techniques for adequate pain control
3. Understand the possible local and systemic complications associated with local anesthesia administration.

Course Scope and Content: (Lecture)

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Unit I

Nitrous Oxide Sedation 4 Hours Lecture

A. Sedation Equipment Operation and Safety
B. Fundamentals of Sedation and Indications for use
C. Steps for Nitrous Oxide/Oxygen Sedation
D. Calculations and Documentation
E. Contraindications to Administration
F. Pharmacology and Physiology of Nitrous Oxide/Oxygen

Unit II Pharmacology of LA, Dose Calculations, Vasoconstrictors and Topicals

A. Classification of Local Anesthetics
B. Pharmacology of Local Anesthetics
C. Pharmacology of Vasoconstrictors
D. Dose Calculations of Local Anesthetics and Vasoconstrictors
E. Topical Anesthetics, Use and Pharmacological Considerations

Unit III Physical and Psychological Evaluation for Administration of Local Anesthesia

A. Biotransformation
B. Allergy
C. Adverse Reactions
D. The Health History
E. Anatomical Considerations

Unit IV Anesthetic Delivery Armamentarium and Fundamental of Administration

A. The Syringe
B. The Needle
C. The Cartridge
D. Preparation of the Armamentarium
E. Steps in Administration

Unit V Techniques for Maxillary Anesthesia, Facial Approach

A. Anterior Superior Alveolar Nerve Block
B. Middle Superior Alveolar Nerve Block
C. Posterior Superior Alveolar Nerve Block
D. Infraorbital Nerve Block

Unit VI Techniques for Maxillary Anesthesia, Palatal Approach

A. Unique Considerations Regarding Palatal Delivery of Anesthetic
B. Pressure Anesthesia
C. Greater Palatine Nerve Block
D. Nasopalatine Nerve Block
E. Anterior Middle Superior Alveolar Nerve Block

Unit VII Techniques for Mandibular Anesthesia

A. Significant Differences Between Maxillary and Mandibular Anesthesia
B. Mental Nerve Block
C. Incisive Nerve Block
D. Inferior Alveolar Nerve Block
E. Lingual Nerve Block
F. Gow-Gates Nerve Block

Unit XIII Supplemental Anesthesia Techniques
A. Supraperiosteal Injection
B. Intraseptal Injection

Unit XIV Dental Local Anesthetic Drugs
A. The Two Local Anesthetic Families
B. Difference Between the Drugs Within Each Family
C. Anesthetic Selection and Contraindications

Unit XV Complications and Management
A. Local Complications
B. Systemic Complications

Unit XVI Troubleshooting Inadequate Anesthesia
A. Provider/Technique Related Considerations
B. Patient Response/Psychological Considerations
C. Anatomical/Physical Considerations

Unit XVII Adjunctive Strategies in Pain Control
A. Periodontal Ligament Injection
B. Buffered Local Anesthetics
C. OraVerse
D. Computer Controlled Local Anesthetic Delivery
E. Needle-less Techniques
1. Oraqix
2. Cetacaine
3. Intranasal Spray

Course Scope and Content: (Laboratory)

Unit I Armamentarium
A. Proper Assembling of Needle, Cartridge and Syringe
B. Scoop Technique
C. Proper Disposal of Needle and Cartridge
D. Care and Maintenance of Syringe

Unit II Basic Injection Technique
A. Steps and Sequence
B. Aspiration
C. Deposition
D. Charting
E. Calculations

Unit III Administration of Local Anesthesia on Partners
A. Inferior Alveolar Nerve Block
B. Lingual Nerve Block
C. Mental Nerve Block
D. Incisive Nerve Block
E. **Long** Buccal Nerve Block
F. Intraseptal Injection
G. Anterior Superior Alveolar (ASA) Nerve Block (infraorbital)
H. Middle Superior Alveolar (MSA) Nerve Block

I. Posterior Superior Alveolar (PSA) Nerve Block
J. Anterior Middle Superior Alveolar (AMSA) Nerve Block
K. Greater Palatine (GP) Nerve Block
L. Nasopalatine (NP) Nerve Block
M. Supraperiosteal Infiltration
N. Gow Gates Nerve Block

Unit IV Administration of Nitrous Oxide Sedation on Partners
A. Titration Method
B. Signs and Symptoms of Sedation
C. Calculations
D. Equipment

Unit V Medical Emergencies
A. Management of Medical Emergencies in the Dental Office course from www.dentalcare.com
B. Role Playing

Unit VI Chart Documentation
A. Computation of Maximum Recommended Dosages for Local Anesthesia
B. Tidal Volume
C. Percentage and Amount of Gases
D. Duration of Nitrous Oxide/Oxygen Administration
E. Patient Response

Learning Activities Required Outside of Class:

The students in this class will spend a minimum of **8** hours per week outside of the regular class time doing the following:
Independent reading and studying**,** completing homework and reviewing instructional videos

Methods of Instruction:

1. Lecture
2. Class discussions
3. Audio-visual presentations
4. Lab exercises designed to prepare student for administration of local anesthetics
5. Demonstration of injection techniques
6. Demonstration of nitrous oxide/oxygen sedation
7. Student participation in clinical administration of local anesthetics
8. Student participation in clinical administration of nitrous oxide sedation
9. Role playing of medical emergencies

Methods of Evaluation:

1. Examinations and quizzes to include:
   a. multiple choice questions
   b. matching questions
   c. true/false questions
   d. case study questions
   e. short answer essay
2. Observation of mock medical emergencies
3. Evaluation of injection techniques on partners
4. Evaluation of nitrous oxide/oxygen sedation on partners

Laboratory Category: Extensive Laboratory

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Pre delivery criteria: All of the following criteria are met by this lab.

1. Curriculum development for each lab.
2. Published schedule of individual laboratory activities.
3. Published laboratory activity objectives.
4. Published methods of evaluation.
5. Supervision of equipment maintenance, laboratory setup, and acquisition of lab materials and supplies.

During laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is physically present in lab when students are performing lab activities.
2. Instructor is responsible for active facilitation of laboratory learning.
3. Instructor is responsible for active delivery of curriculum.
4. Instructor is required for safety and mentoring of lab activities.
5. Instructor is responsible for presentation of significant evaluation.

Post laboratory activity of the laboratory: All of the following criteria are met by this lab.

1. Instructor is responsible for personal evaluation of significant student outcomes (lab exercises, exams, practicals, notebooks, portfolios, etc.) that become a component of the student grade that cover the majority of lab exercises performed during the course.
2. Instructor is responsible for supervision of laboratory clean up of equipment and materials.

Supplemental Data:

TOP Code:	124020: Dental Hygienist
SAM Priority Code:	C: Clearly Occupational
Distance Education:	Not Applicable
Funding Agency:	Y: Not Applicable(funds not used)
Program Status:	1: Program Applicable
Noncredit Category:	Y: Not Applicable, Credit Course
Special Class Status:	N: Course is not a special class
Basic Skills Status:	N: Course is not a basic skills course
Prior to College Level:	Y: Not applicable
Cooperative Work Experience:	N: Is not part of a cooperative work experience education program

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Eligible for Credit by Exam:	NO
Eligible for Pass/No Pass:	NO
Taft College General Education:	NONE
Discipline:	Dental Technology